

REMARKS

Applicants respectfully request reconsideration of the above-captioned application. Claim 2 has been amended for readability and claims 9-12 have been added to expressly recite the embodiment shown in Figure 12 and described beginning at page 8 line 12 of the originally filed application.

The Office Action includes an objection to the drawings suggesting that claims 3, 4 and 5 should also include the legend "prior art". Applicants concurrently file herewith a Request for Approval of Drawing Changes adopting the Examiner's suggestion. Upon approval, formal drawings will be filed.

The Office Action includes a rejection of claims 1 and 5 under 35 U.S.C. §102(b) as allegedly being anticipated by Applicant's admitted prior art.¹ This rejection is respectfully traversed.

At page 3 of the Office Action, the Office suggests that the repulsive elements of claim 1 is met by Figure 5 which shows the displacement as a variable in figuring out the repulsive force and that it would be apparent that the displacement is an element in factoring the repulsive force. Hence, it appears that the Office is identifying the *action* of "displacement" with the *physical* repulsive elements of the *device* claims. Specifically, claim 1 recites a MEMS device which includes *inter alia* substrate, support elements, a movable element, flexure elements, driving element and, most relevant, "repulsive elements for increasing the repulsive force of the flexure elements when the flexure

¹ I believe that the Examiner meant to invoke 35 U.S.C. §102(a).

elements supporting the movable element are resiliently deformed by a predetermined amount during movement of a movable element." It is respectfully submitted that an action cannot be equated with a physical object and that Applicant's description of prior art as shown in Figures 1-5 do not include repulsive elements as described in the immediately preceding sentence.

In light of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1 and 5.

The Office Action also includes a rejection of claims 1-8 under 35 U.S.C. §102(e) as allegedly being anticipated by the *Sun* patent (U.S. Patent No. 6,307,452). This rejection is respectfully traversed.

The *Sun* patent addresses a folded spring based micro- mechanical (MEM) RF switch which, as shown in Figures 5a and 5b includes a shorting bar 34 formed on a spring suspended micro-platform 20 in a conventional manner known in the art. The shorting bar 34 extends from beneath the microplatform 20 to cover a contact post 32. See column 3, lines 62-65. In operation, as described at column 4, lines 28 *et seq.*, the microplatform 20 is moved towards the substrate 12 and the shorting bar makes contact with the underlying contact post 32 to produce a low impedance switch "on" signal as illustrated in Figure 5b.

Once the shorting bar 34 makes contact with the contact post 32, it is not longer moving. Thereafter, the microplatform 20 continues to deform by, as stated in column 4, lines 14-17, landing bumpers 26, which are used as mechanical buffers to prevent the microplatform from directly impacting against the bottom electrode 14. Also, from reading column 5, beginning at line 13, the landing bumpers 26 apparently have an affect

on the deforming of the microplatform 20 so that it maintains a flat plane when touching the underlying contact post 34.

As such, the *Sun* patent does not meet the recitations of claim 1. For instance, claim 1 recites that repulsive element increase the repulsive force of the flexure elements when the flexure elements supporting the movable element are resiliently deformed *by a predetermined amount during movement of the movable element*. The bumper landings 26 as illustrated in Figures 5a and 5b neither function nor are designed to increase the repulsive force of the flexure elements when they have been deformed by a predetermined amount *during movement* of the movable element. They only engage *after* the microplatform 20 has made contact with the contact post 32, and when the microplatform 20 has sufficiently deformed after its movement has been stopped by contact post 32.

In light of the foregoing, Applicants respectfully submit that the *Sun* patent does not anticipate the recitations of claim 1.

Further, there would be no reason to modify the *Sun* patent and, in fact, it would be counterintuitive to do so in a manner which would meet the recitations of claim 1. The bumper landings 26 are apparently designed, in part, to facilitate the platform 20 keeping a flat plane to touch the underlying contact post 32 by asymmetrical structure, in addition to reducing adhesion stictions. Stated differently, by design the bumper landings 26 only engage the microplatform 20 after the microplatform 20 has been seated on the contact posts 32. To change the design of the *Sun* device so that the bumper landings 26 engage the flexible portions of the microplatform 20 before the microplatform 20 contacted contact

post 32 would apparently deteriorate the performance of the microswitch as understood by the undersigned from the description appearing in the *Sun* patent.

Several of the dependent claims also further depart from the *Sun* patent. For instance, claim 4 recites that the flexure elements are stoppers formed *on middle portions of the flexure elements* opposite to the static elements so that the stoppers contact the static element when the flexure elements are resiliently deformed by a predetermined amount. The bumper landings 26 in the *Sun* patent are only shown being formed on the substrate. Also, new claims 9-12 expressly recite the embodiment shown in Figure 12, wherein the movement of the movable element is parallel to a plane of the substrate. The *Sun* patent neither discloses or would suggest a modification to meet these recitations of new claims 9-12.

In light of the foregoing, Applicants respectfully request reconsideration and allowance of the above-captioned application. Should any residual issues exist, the Examiner is invited to contact the undersigned at the number listed below.

Respectfully submitted,

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Date: October 31, 2002



Application No. 10/075,224
Attorney's Docket No. 030681-359
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Attachment to Amendment dated October 31, 2002

Marked-up Claim 2

2. (Amended) The MEMS device of claim 1, wherein the repulsive elements [having a predetermined size] include stoppers having a predetermined size and positioned between the flexure elements and static elements fixed on the substrate opposite to the flexure elements.

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